Forensic porcine pathology

An overview

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Publication date:
2018

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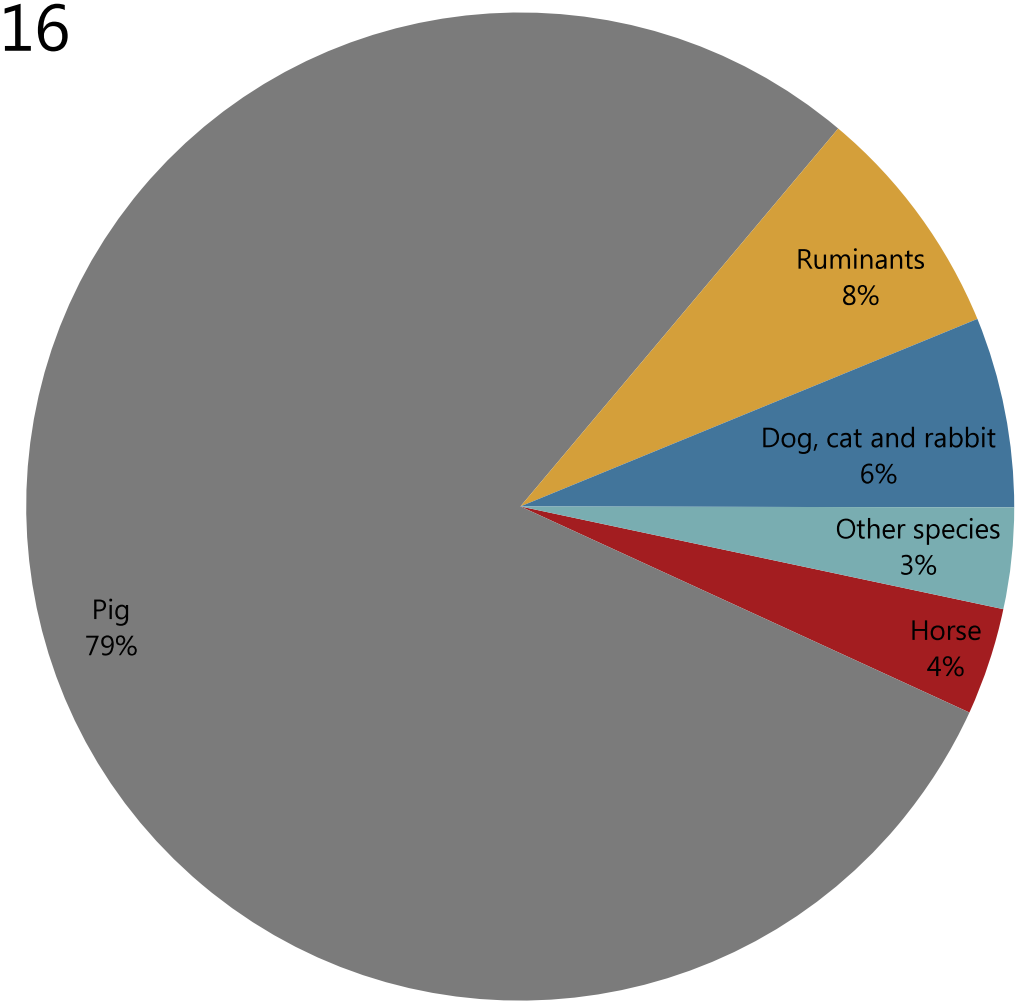
Forensic medicine means,

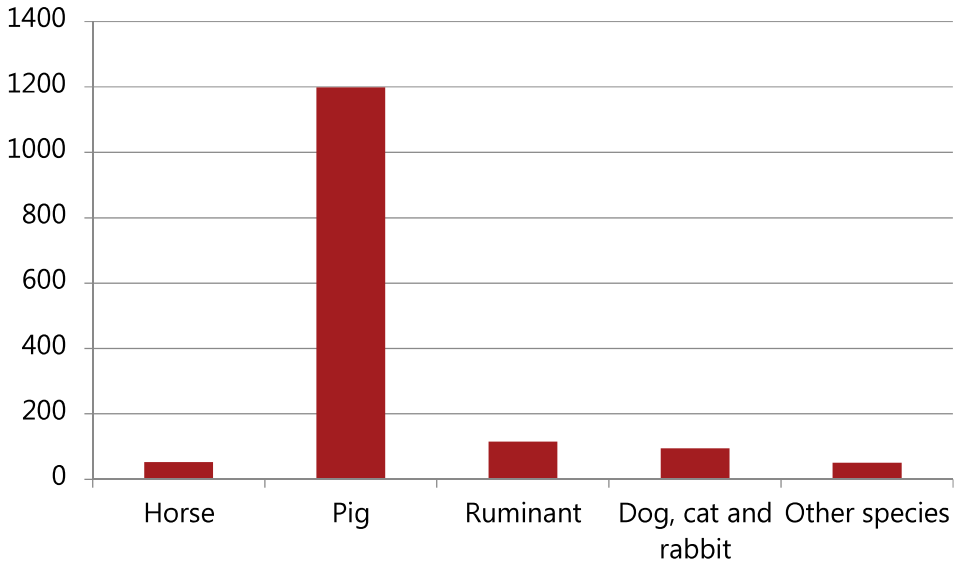
"relating to, used in, or connected with a court of law, i.e. the applied use of medical knowledge, especially pathology, to the purpose of the law".

- 1. Identification of the animal/subject
- 2. External observations
- 3. A complete and correct necropsy
- 4. Registration and objective description of all observations (intra vitally or post-mortem)
- 5. Supplementary examinations
- 6. Interpretation of all information and observations => conclusion (diagnosis, cause and timing)

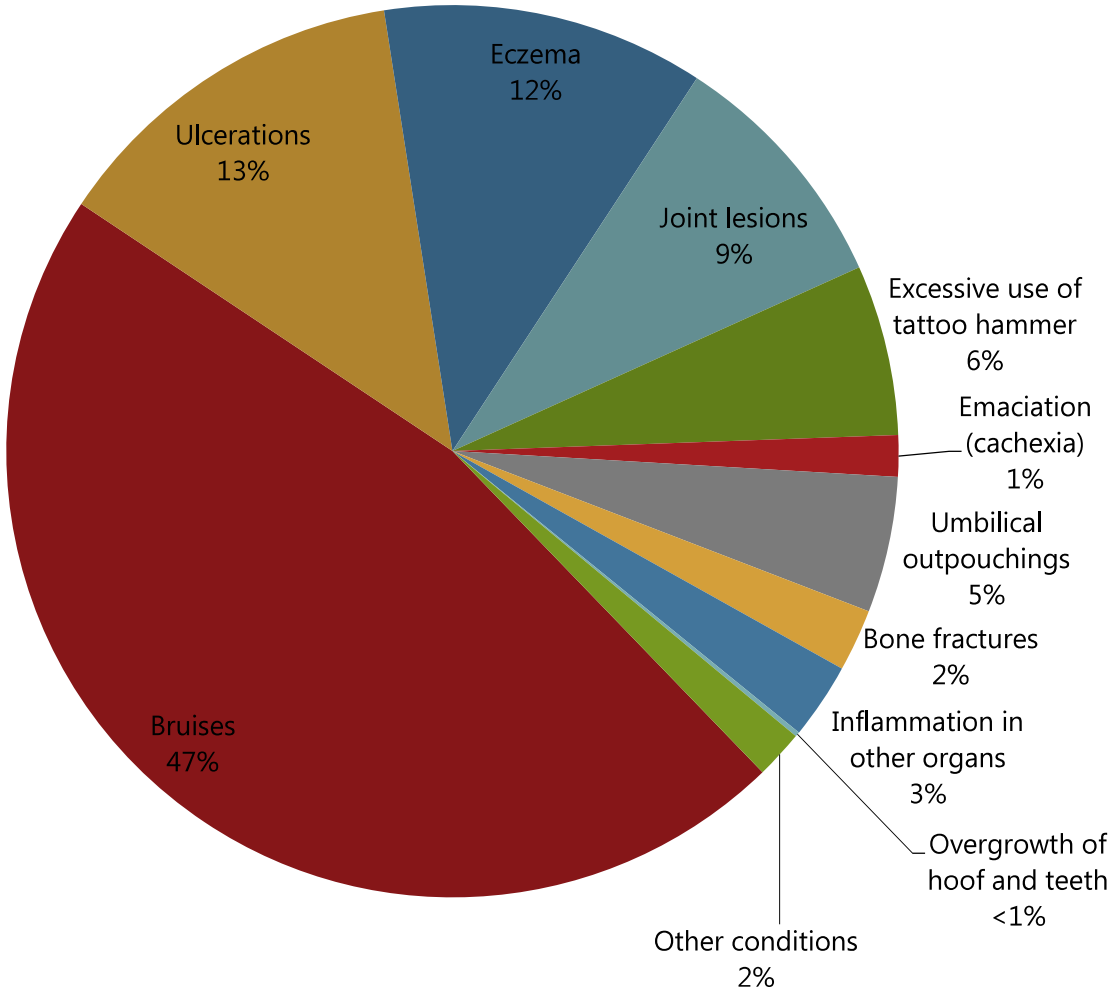
Forensic pathology 2004-2016



Forensic pathology 2004-2016: number of animals



Forensic porcine pathology: 2004-2016



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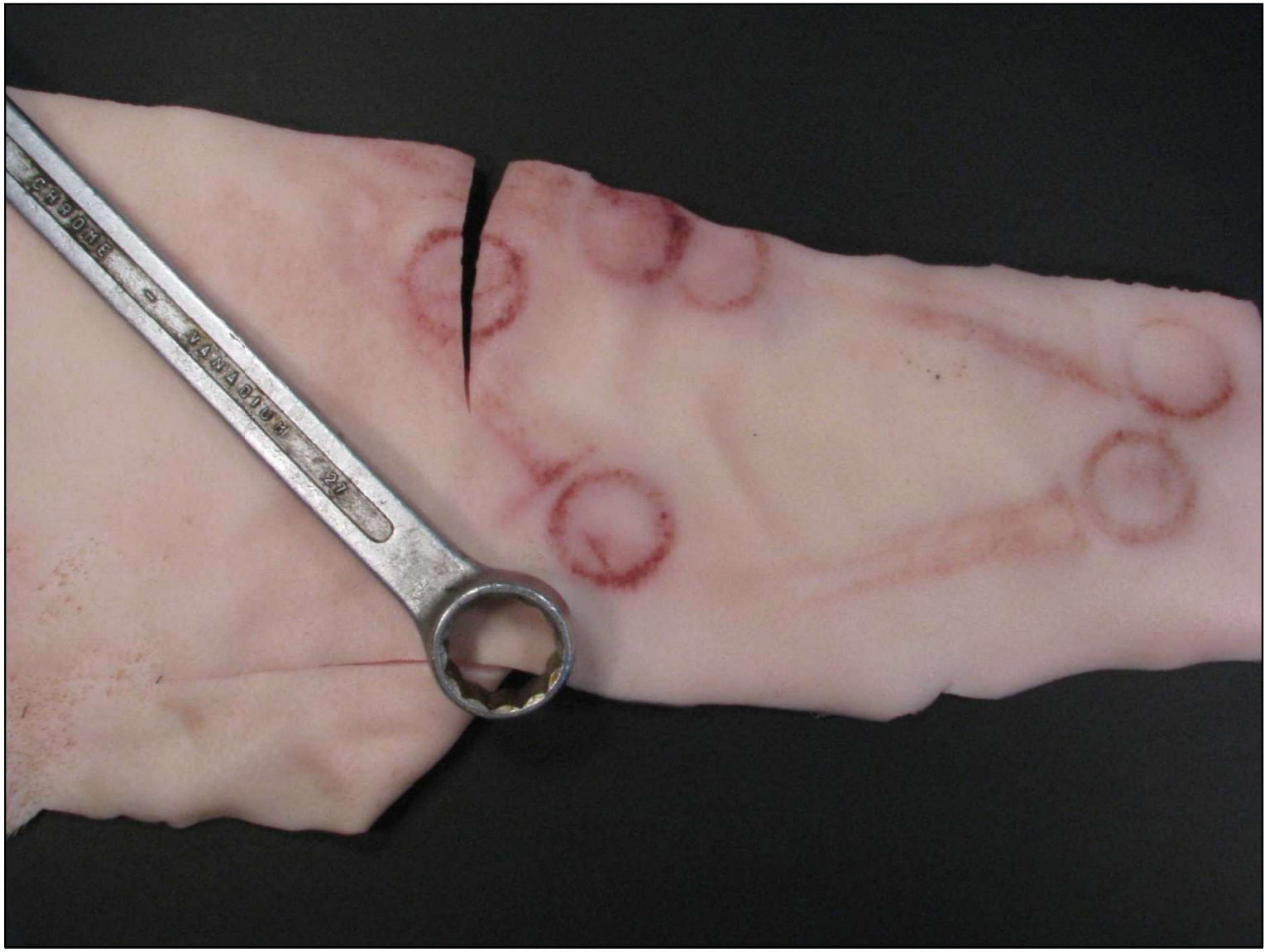
CHROME
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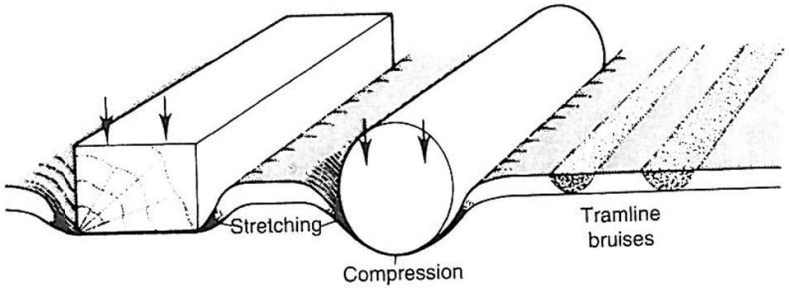
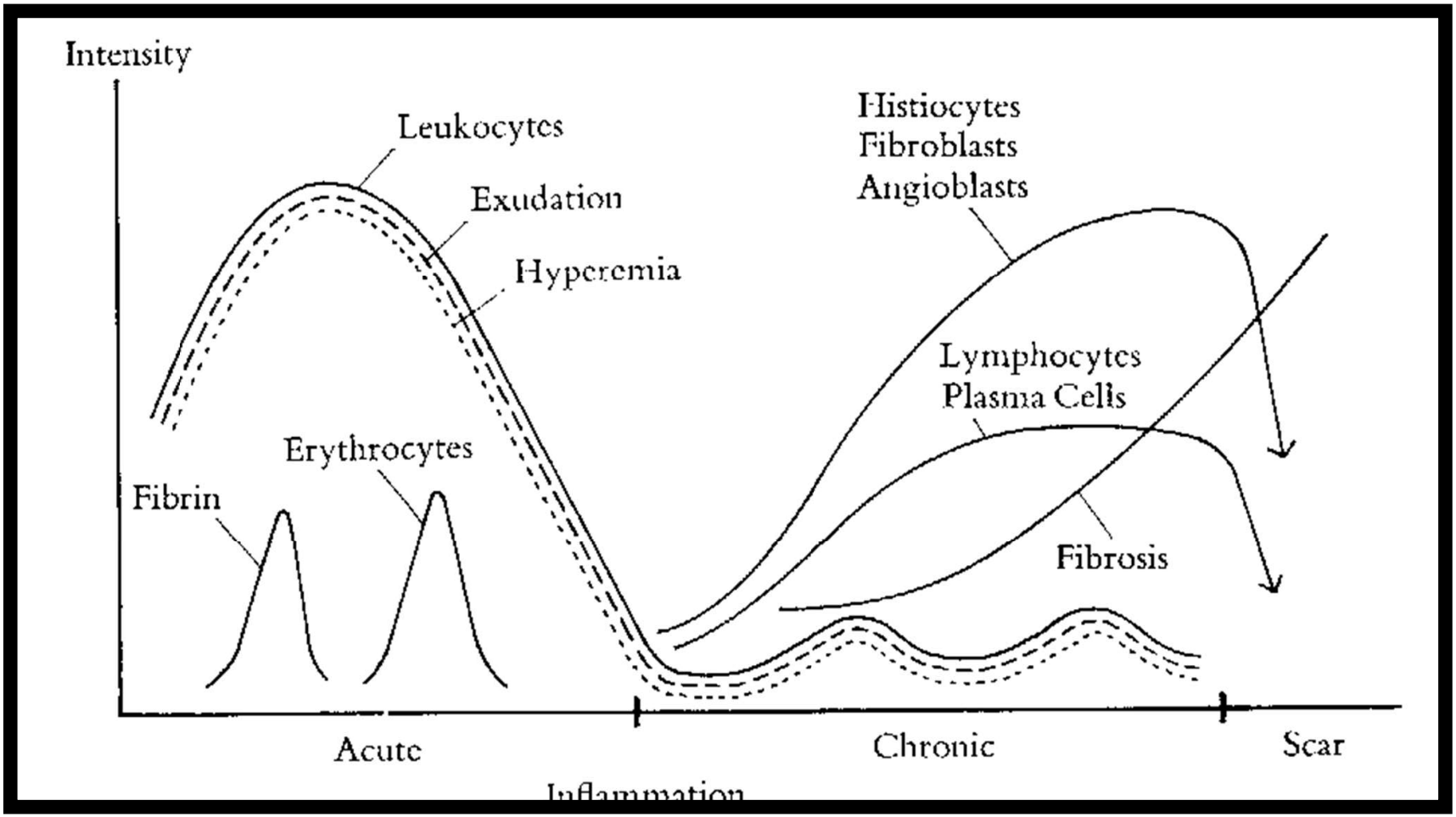
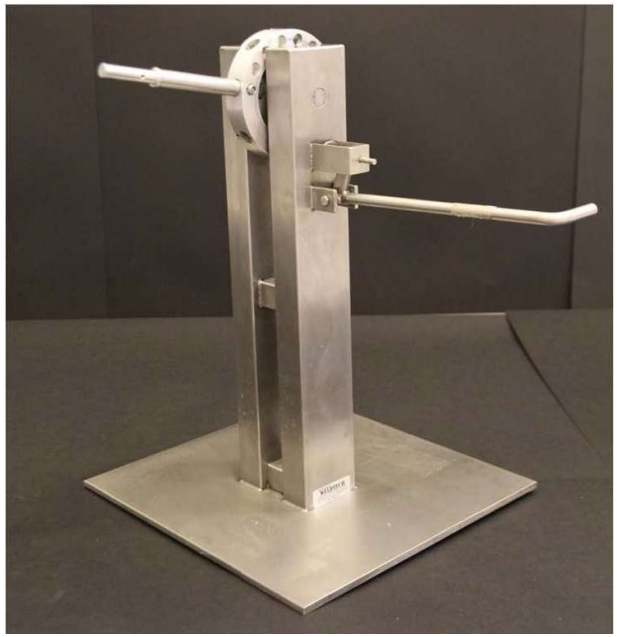


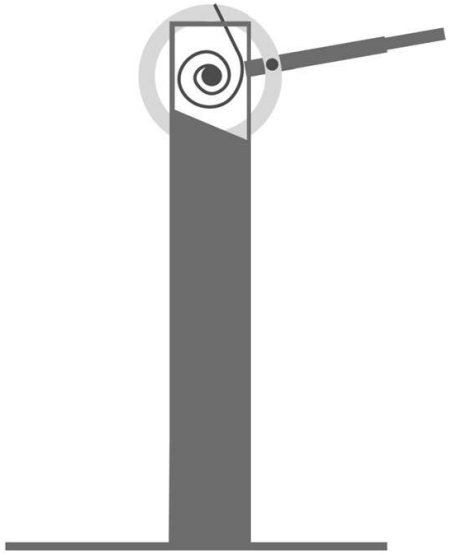
From Knight's Forensic Pathology 3rd edition, Saukko and Knight, 2004.

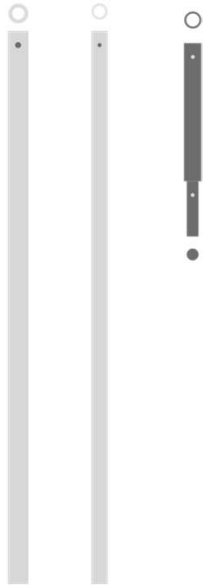
Pattern	Number of pigs (n=101)	
Tramline	51	(50%)
Tattoo-hammer	21	(21%)
Paddle	8	(8%)
Double U profile	6	(6%)
Circle	3	(3%)
Chain	2	(2%)
Other	10	(10%)

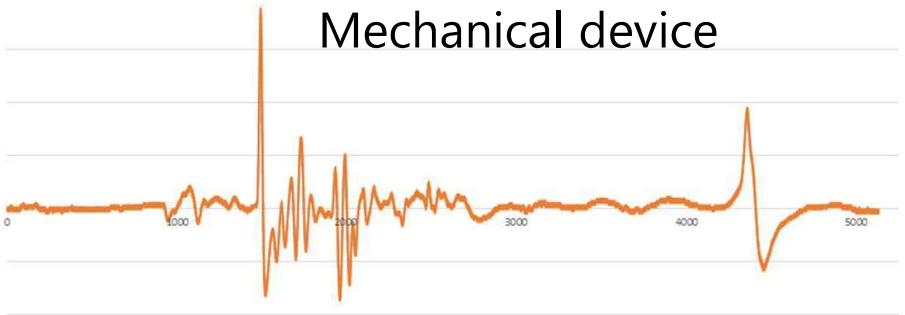

Intensity
Leukocytes
Exudation
Hyperemia
Histiocytes
Fibroblasts
Angioblasts
Lymphocytes
Plasma Cells
Erythrocytes
Fibrin
Fibrosis
Acute
Chronic
Scar
Inflammation

Experimental bruises







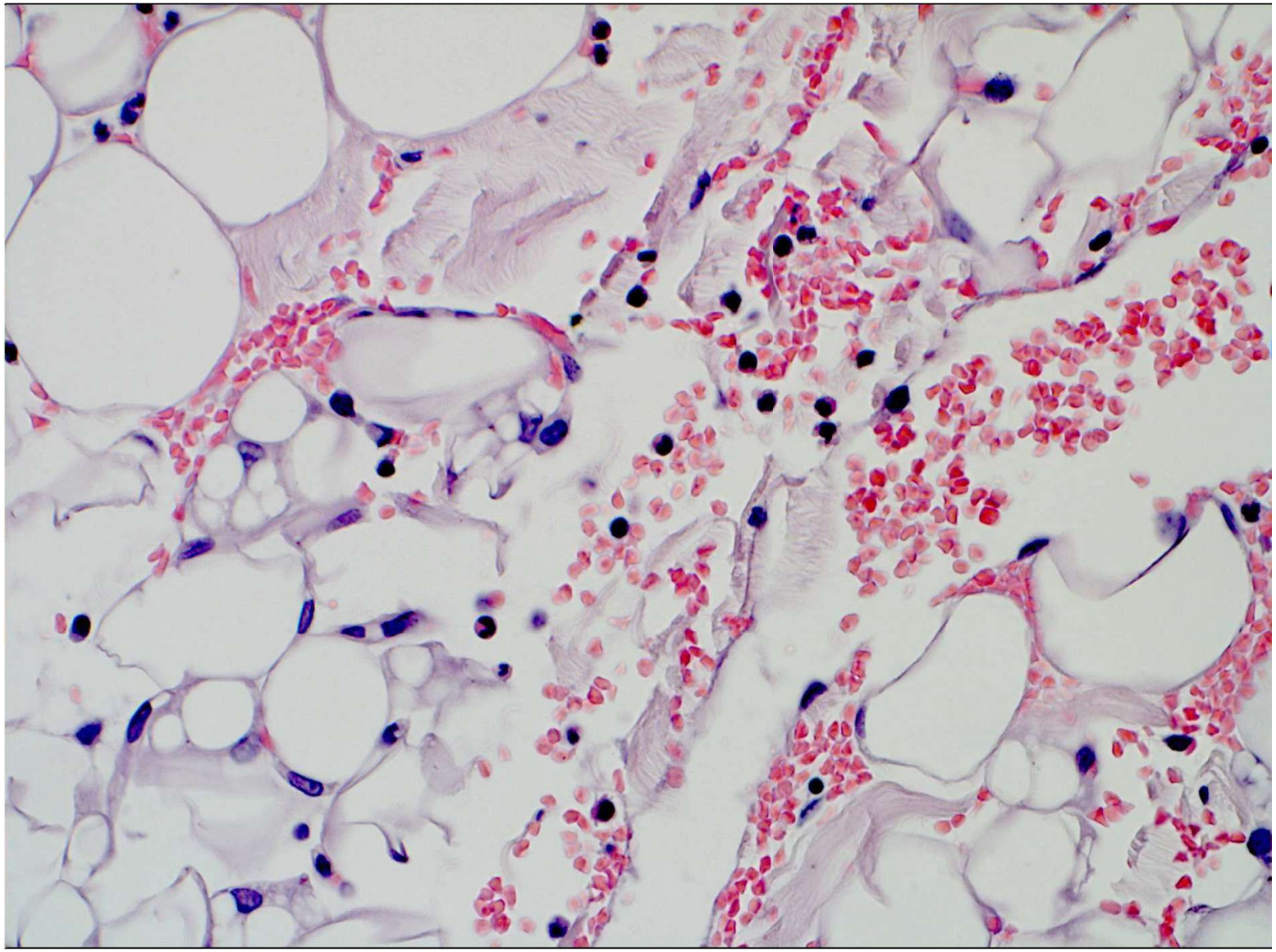


Experimental bruises in pigs

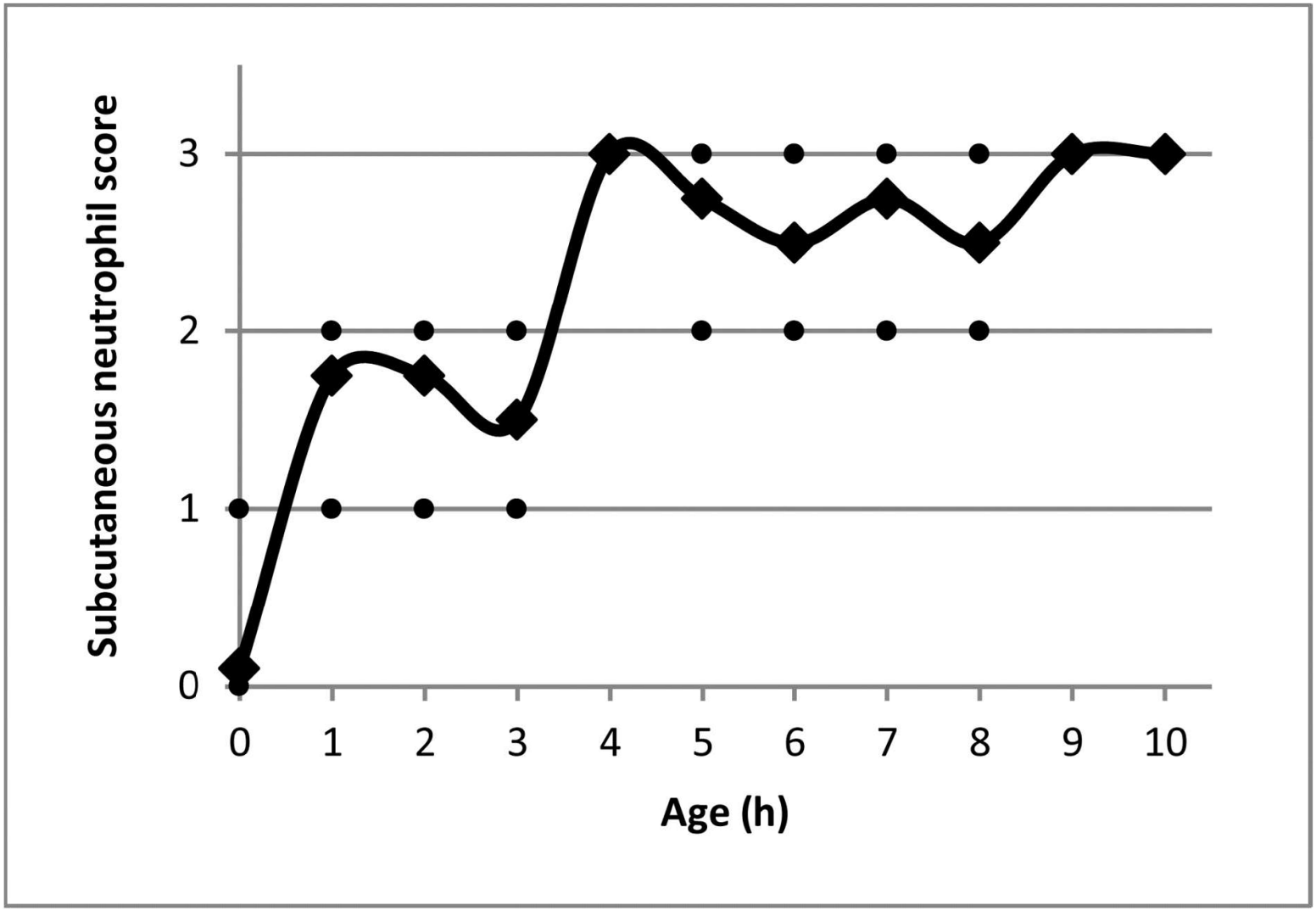
References

- Barington, K. and H.E. Jensen. A novel, comprehensive, and reproducible porcine model for determining the timing of bruises in forensic pathology.
  Forensic Sci. Med. Pathol., 2016, 12, 58-67.
- Barington, K. and H.E. Jensen. The impact of force on the timing of bruises evaluated in a porcine model.
  J. Forensic Leg. Med., 2016, 40, 61-66
- Barington, K., H.E. Jensen and K. Skovgaard. Forensic aspects of gene expression signatures for age determination in bruises as evaluated in an experimental porcine model.
  Forensic Sci, Med Pathol., 2017, 13, 151-160.

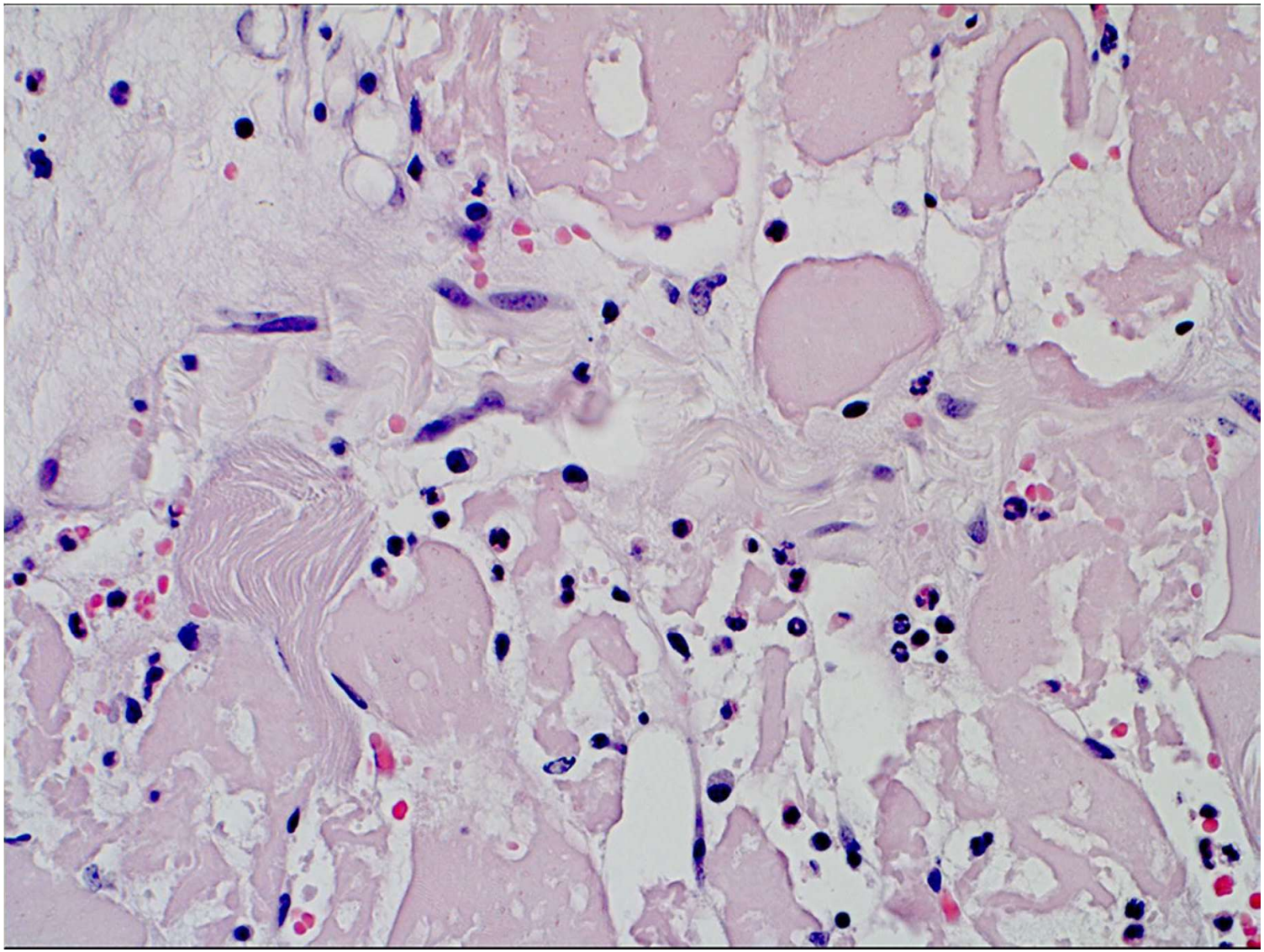
Histology



Neutrophils in the subcutaneous tissue

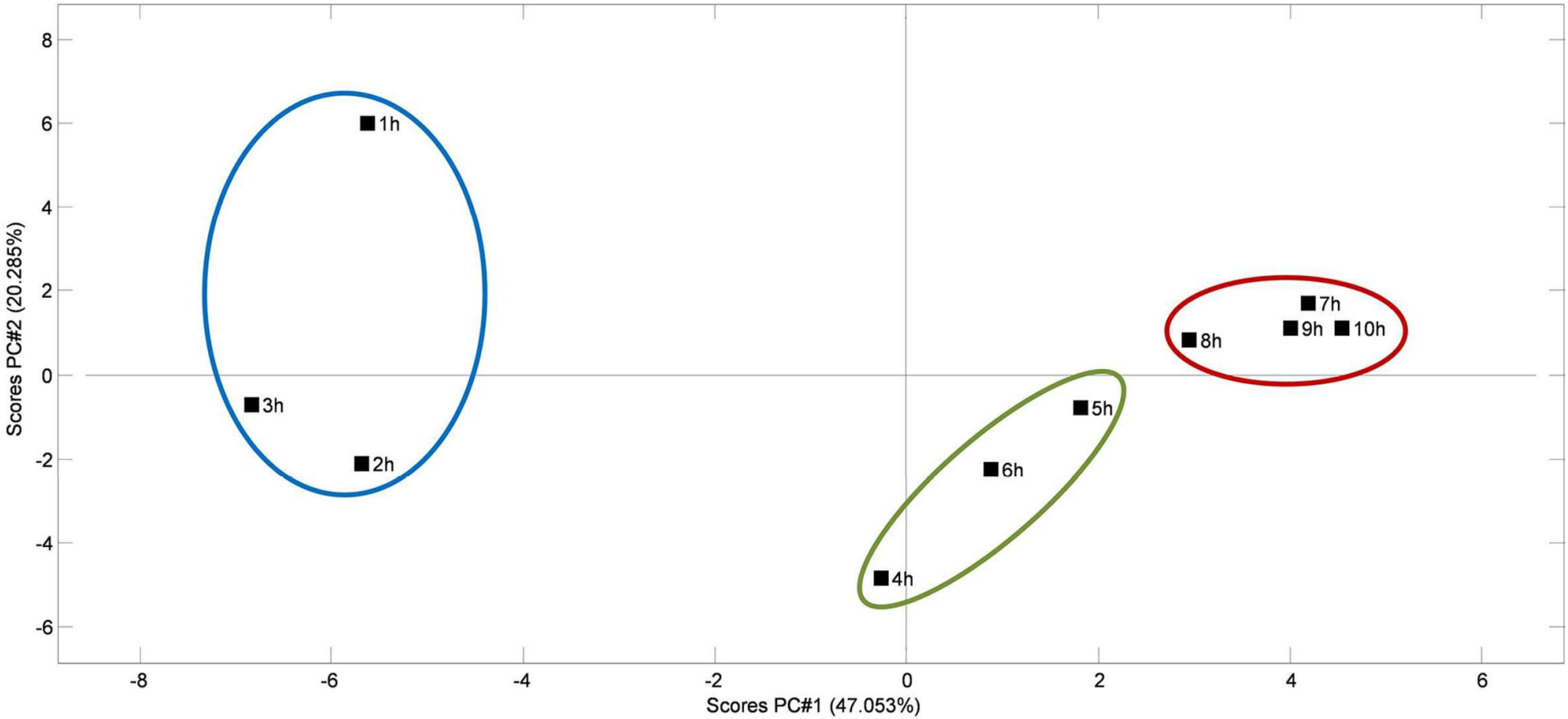


Histology

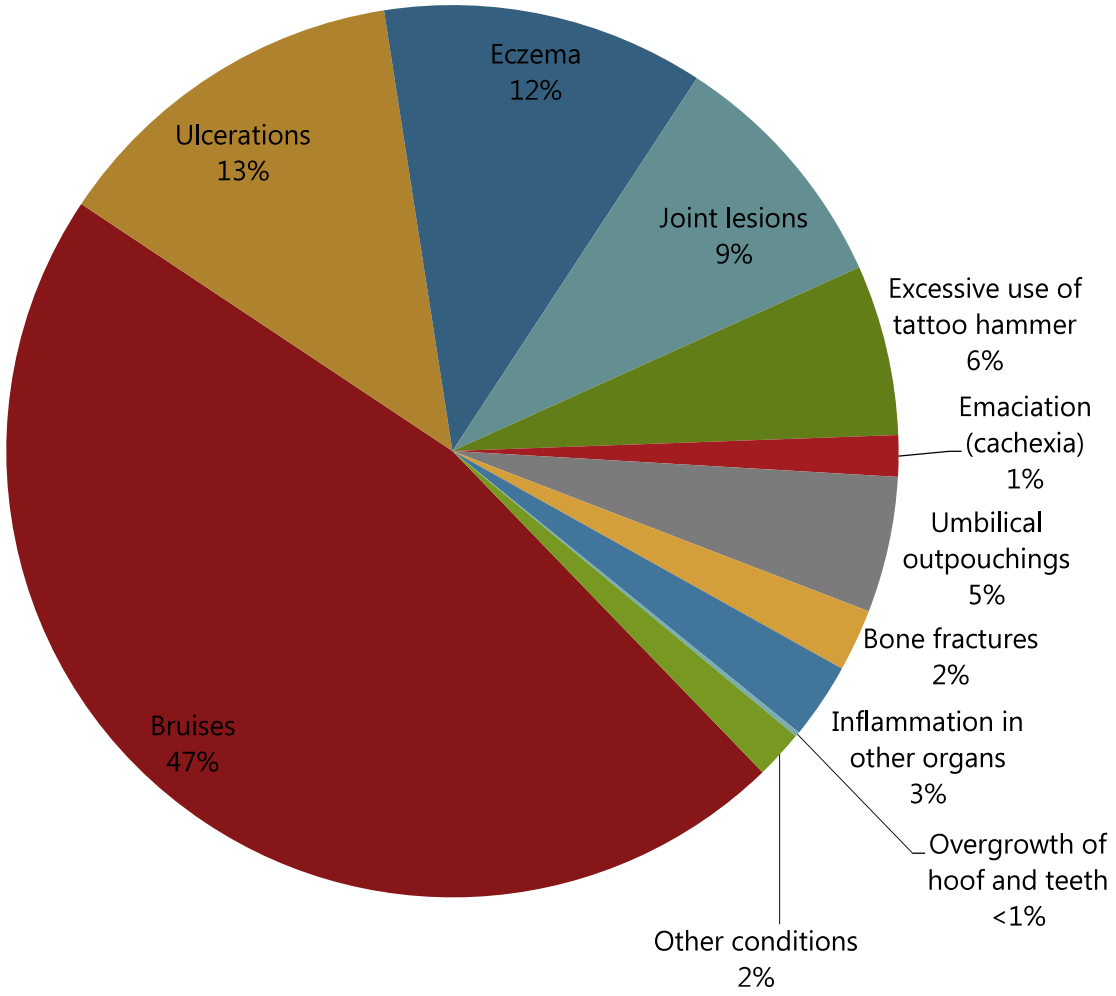


PCA: mRNA expression in the subcutaneous fat

- High force
- 10 pigs with bruises aged from 1 to 10 h
- All genes

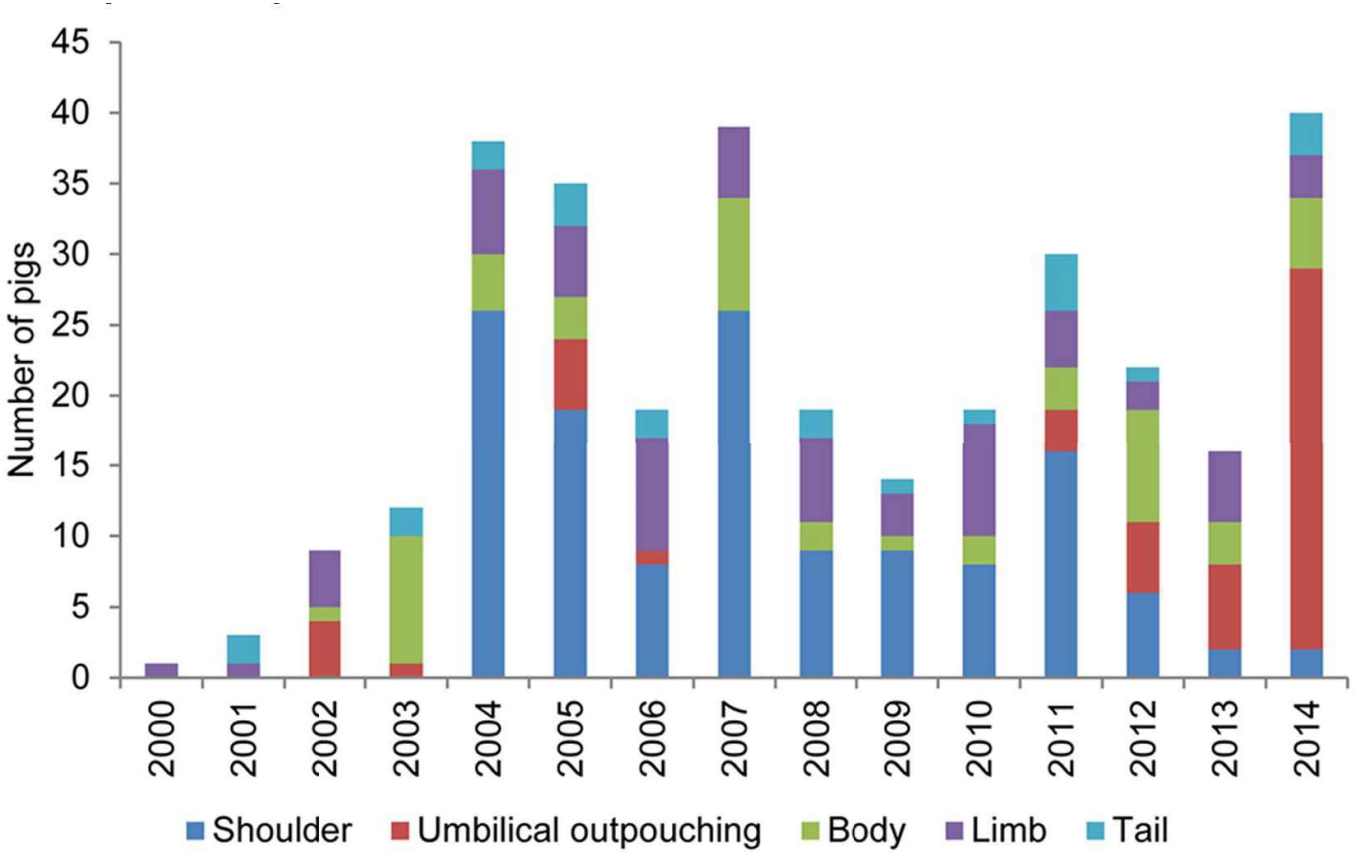


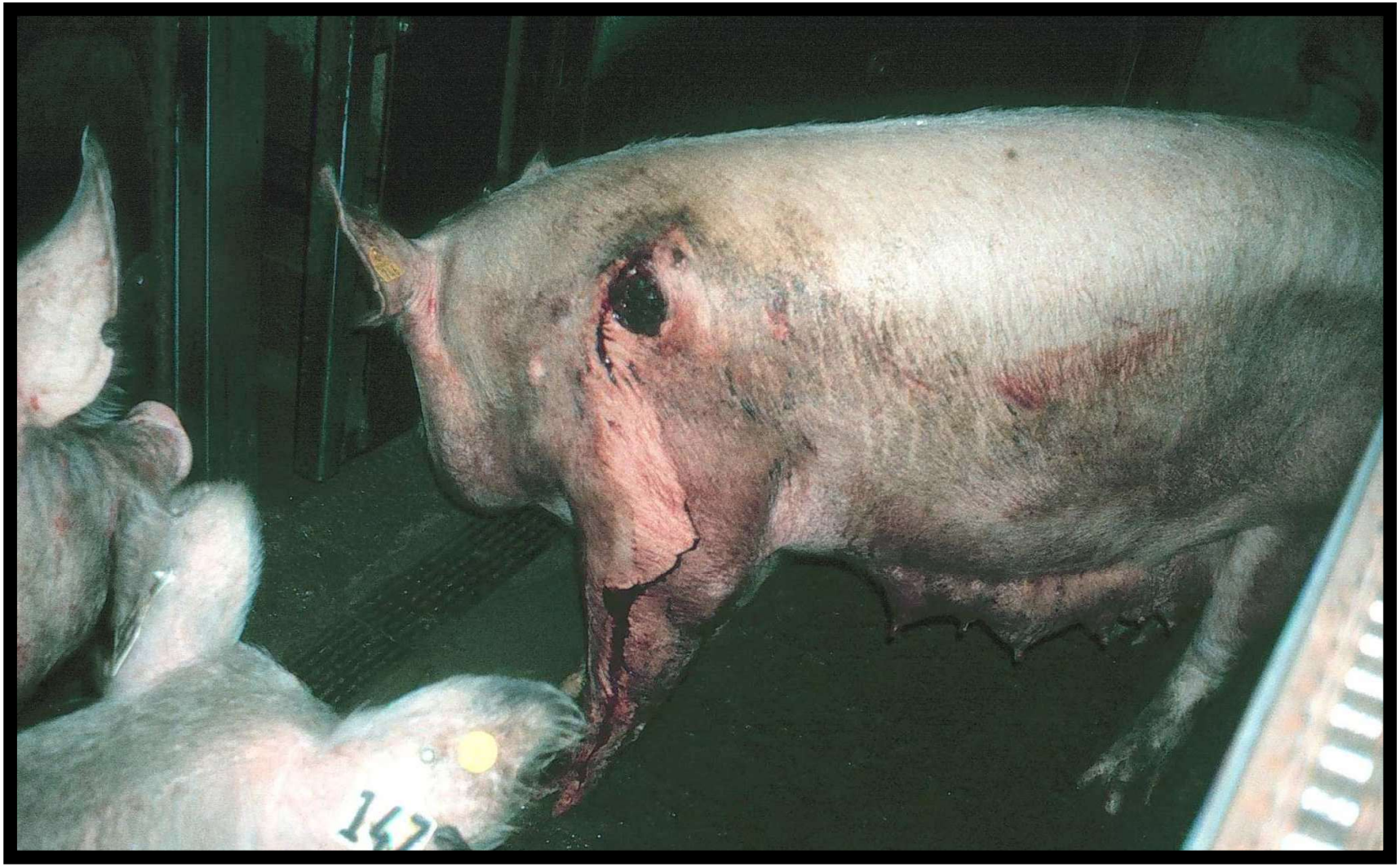
Forensic porcine pathology: 2004-2016



Results

- Anatomical localization of ulcerations

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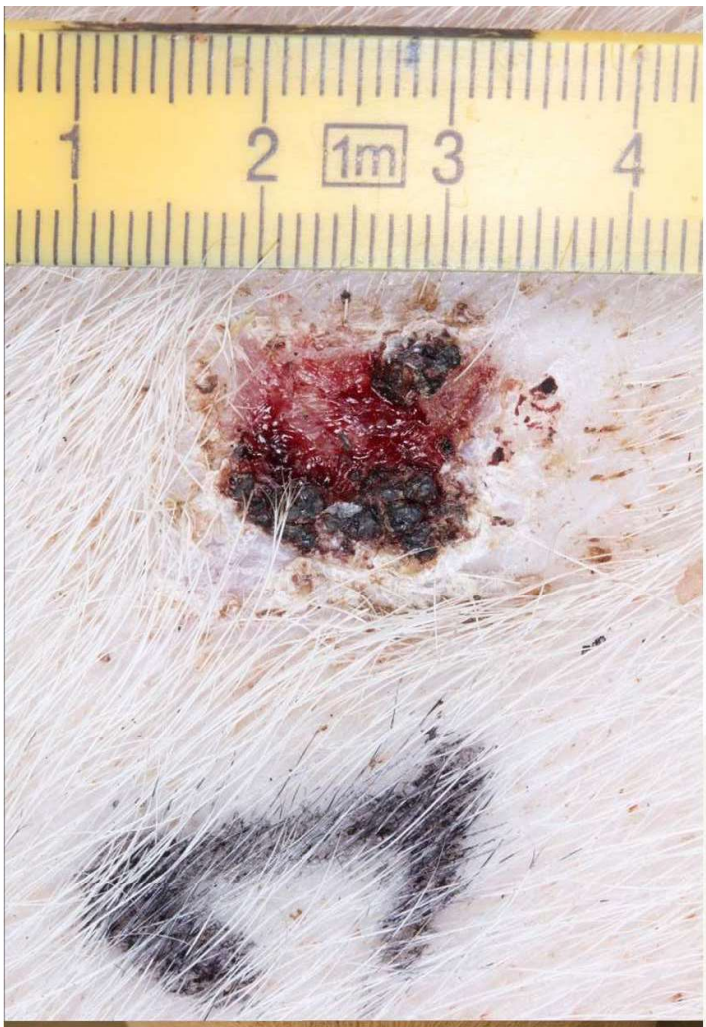
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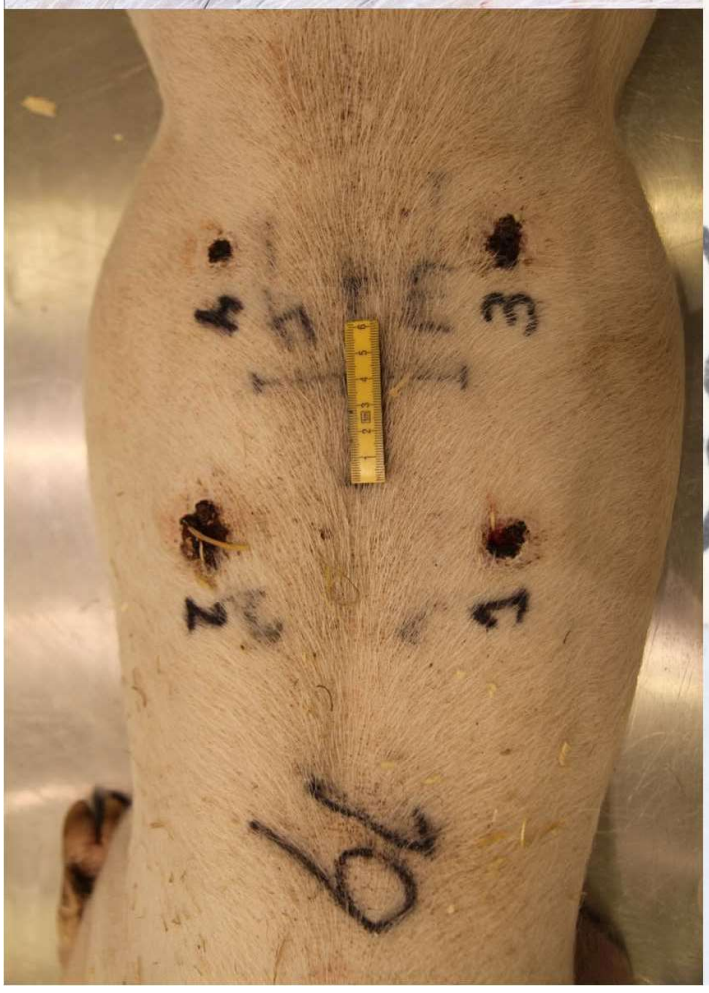


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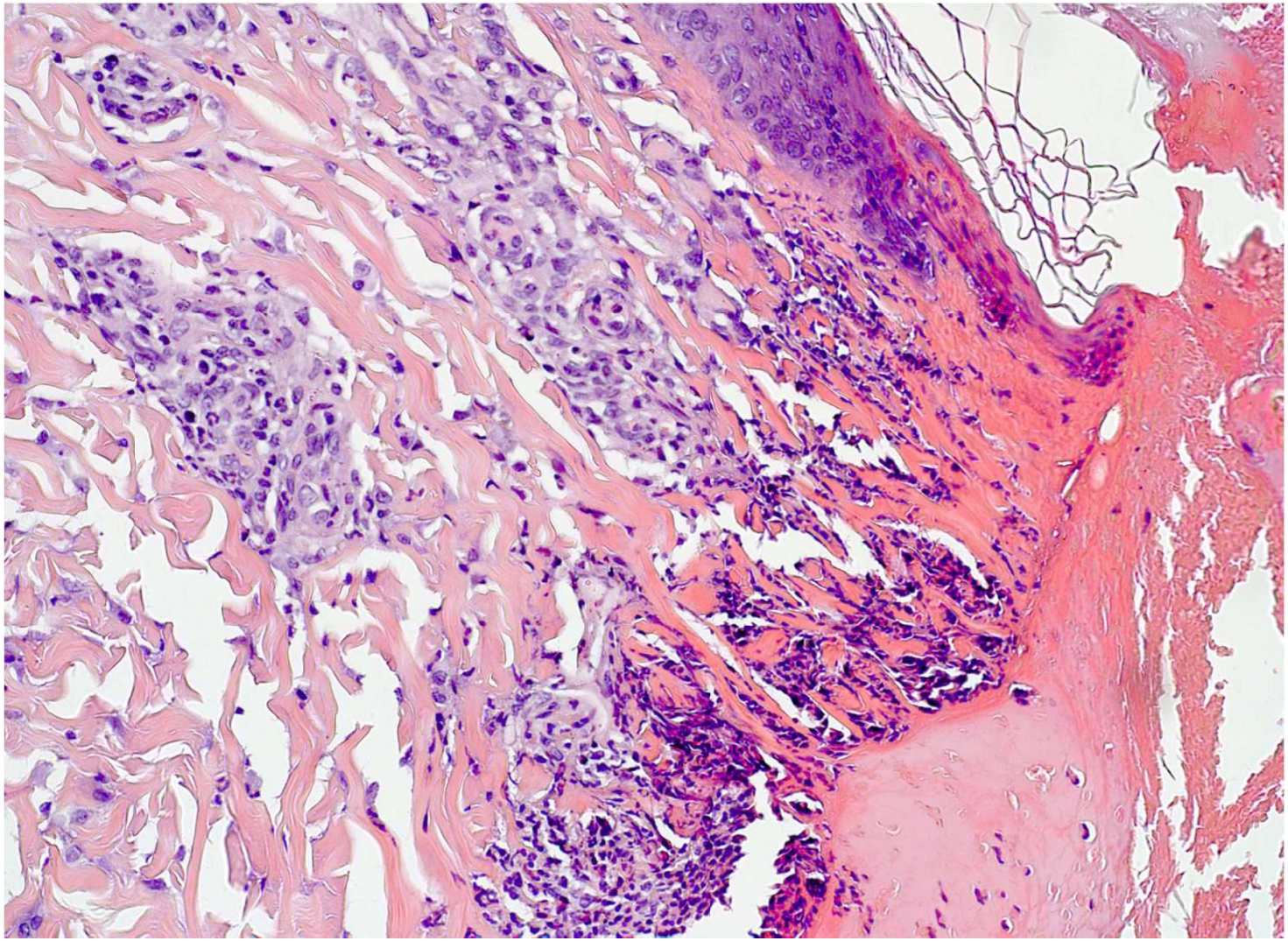
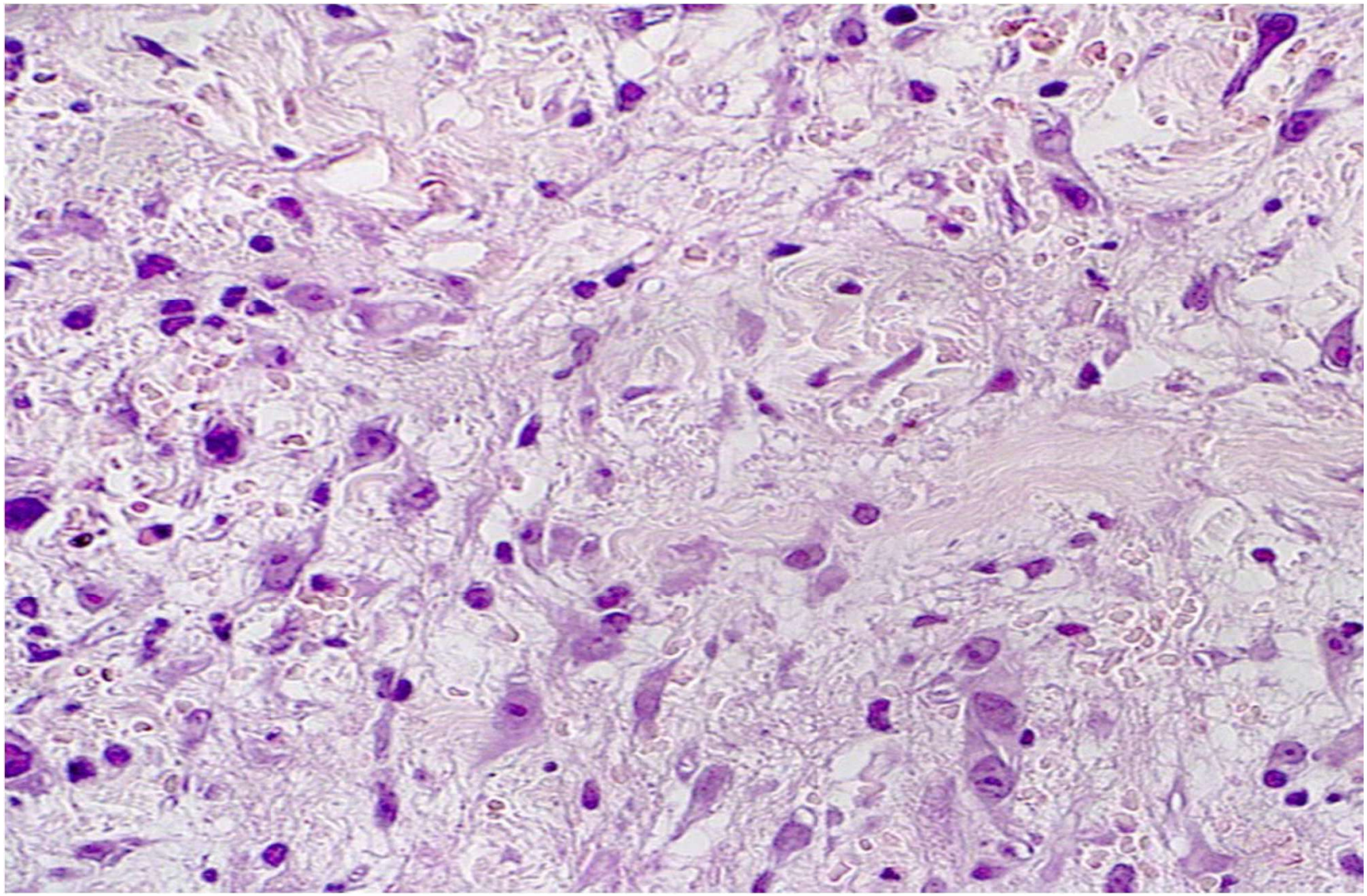
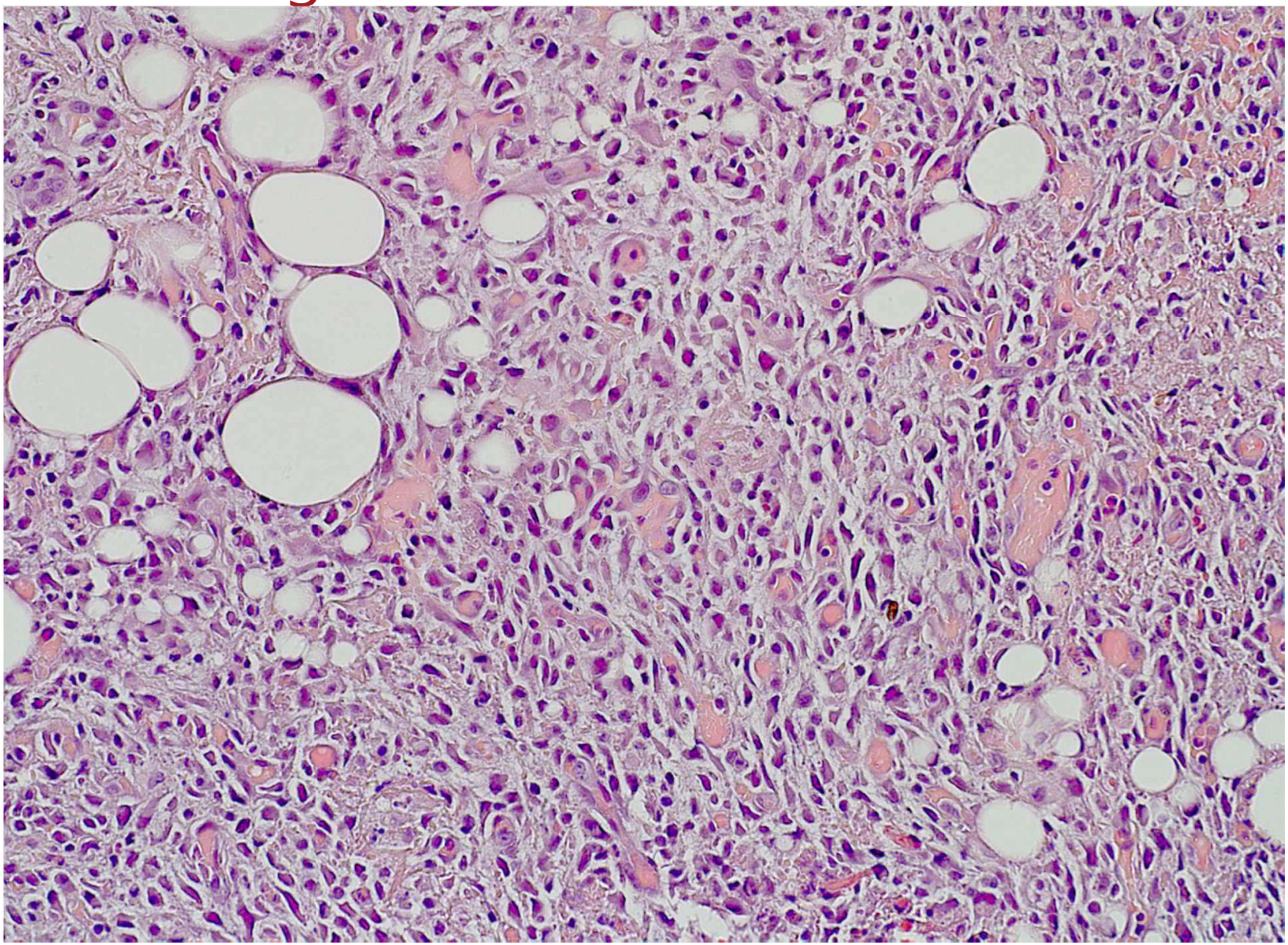
Experimental wound, 12 h
Migration of epithelial cells

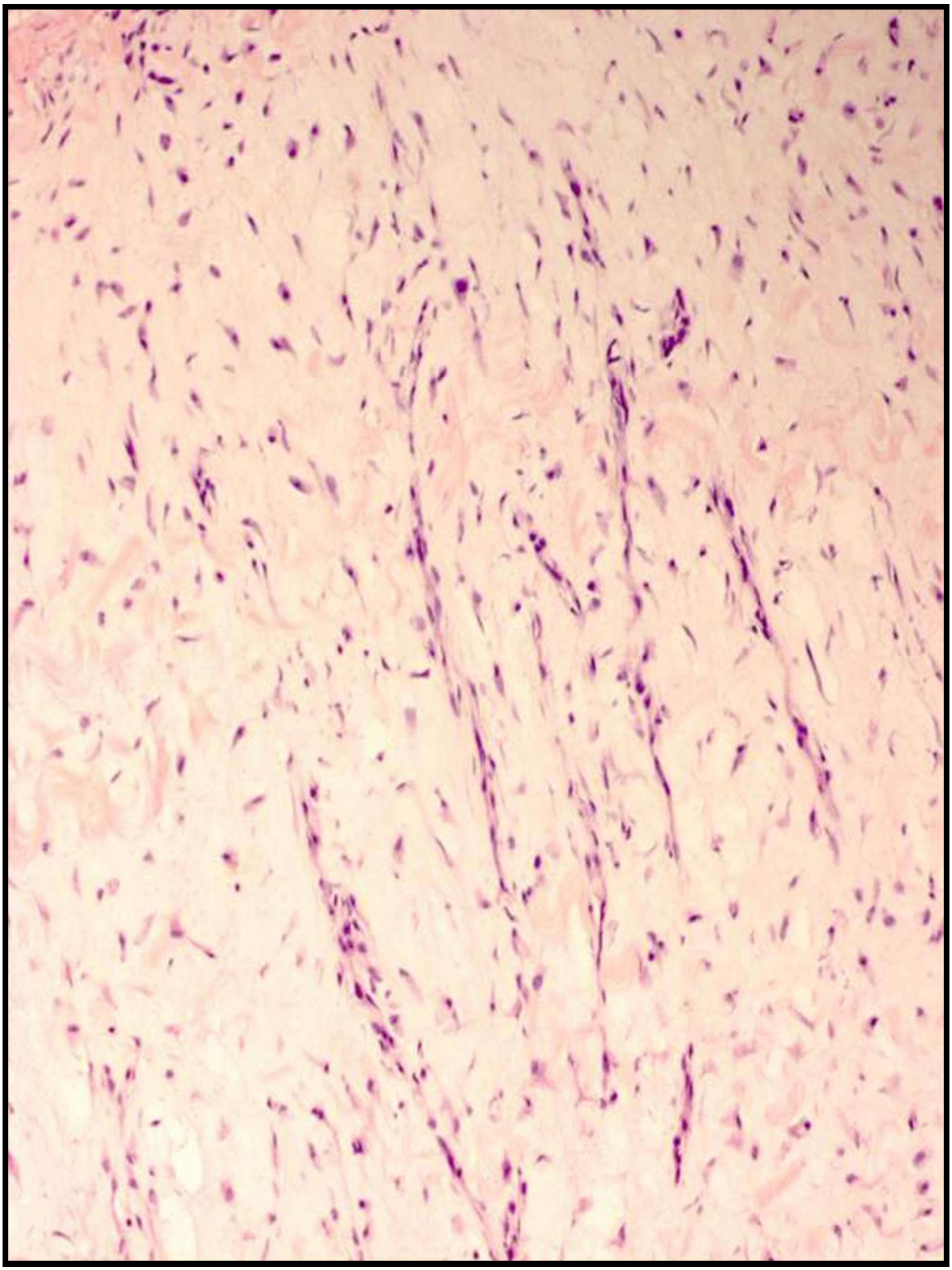


Experimental wound, 3 days
Proliferation of fibroblasts

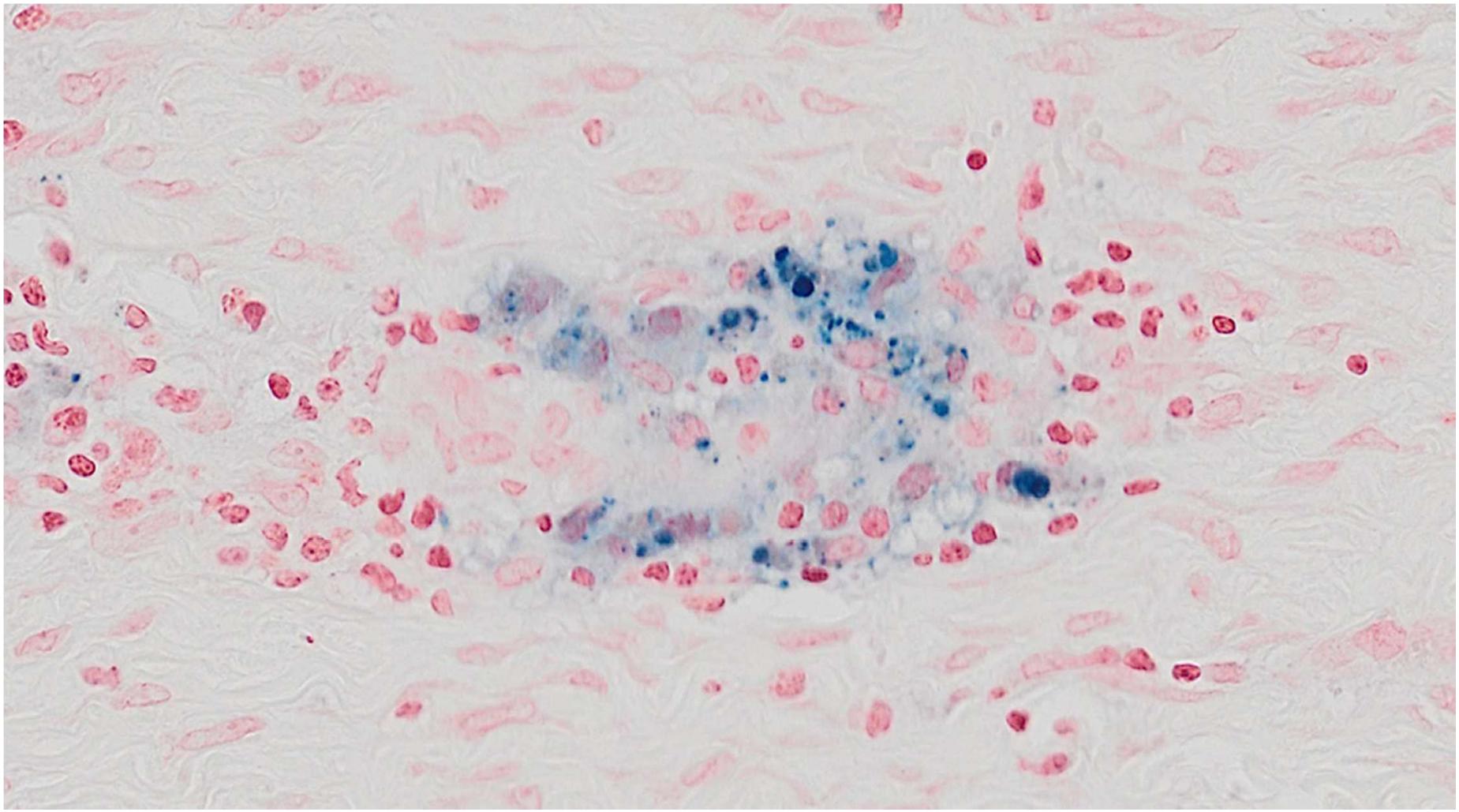


Experimental wound, 4 days
Immature granulation tissue

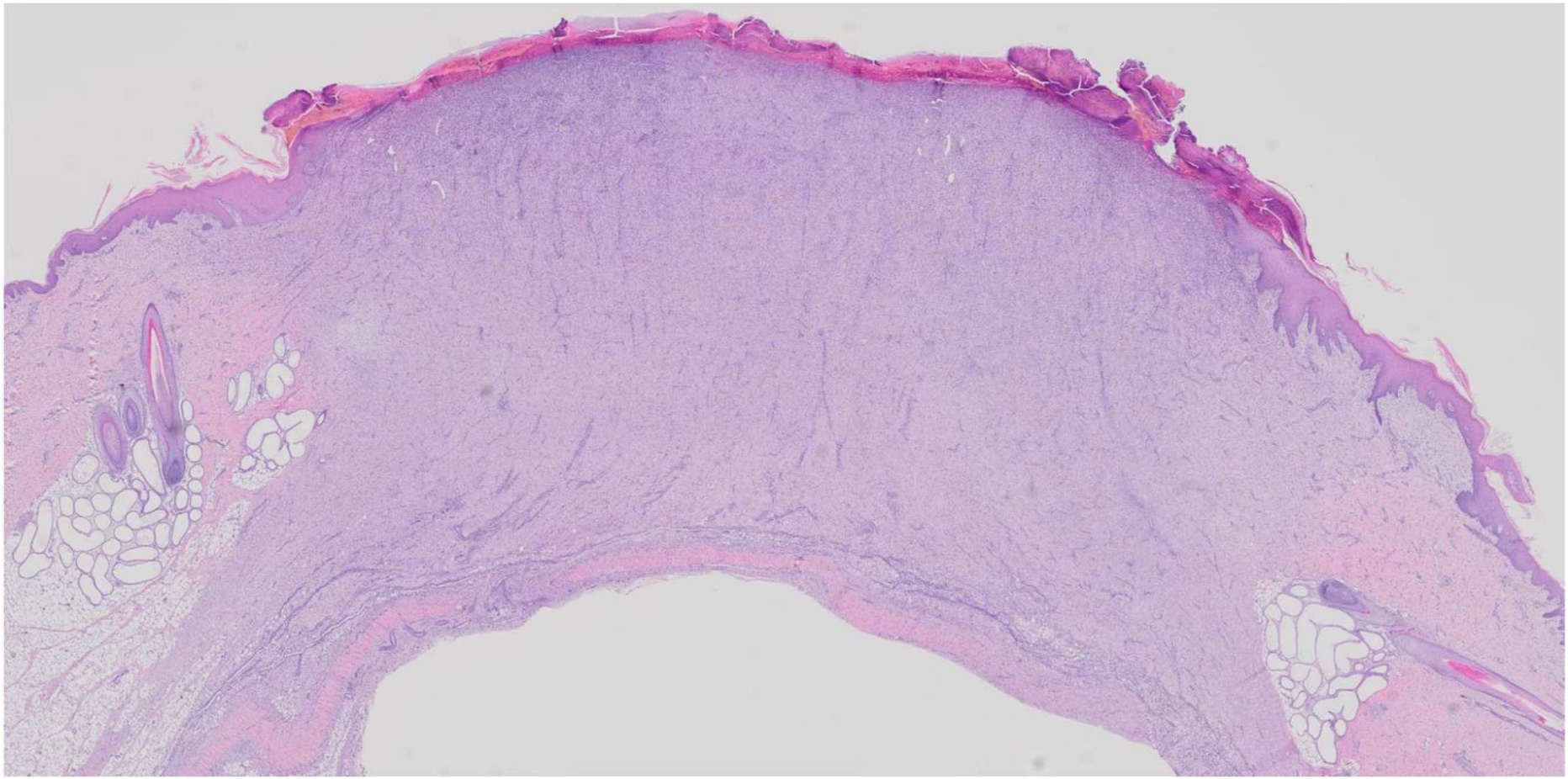




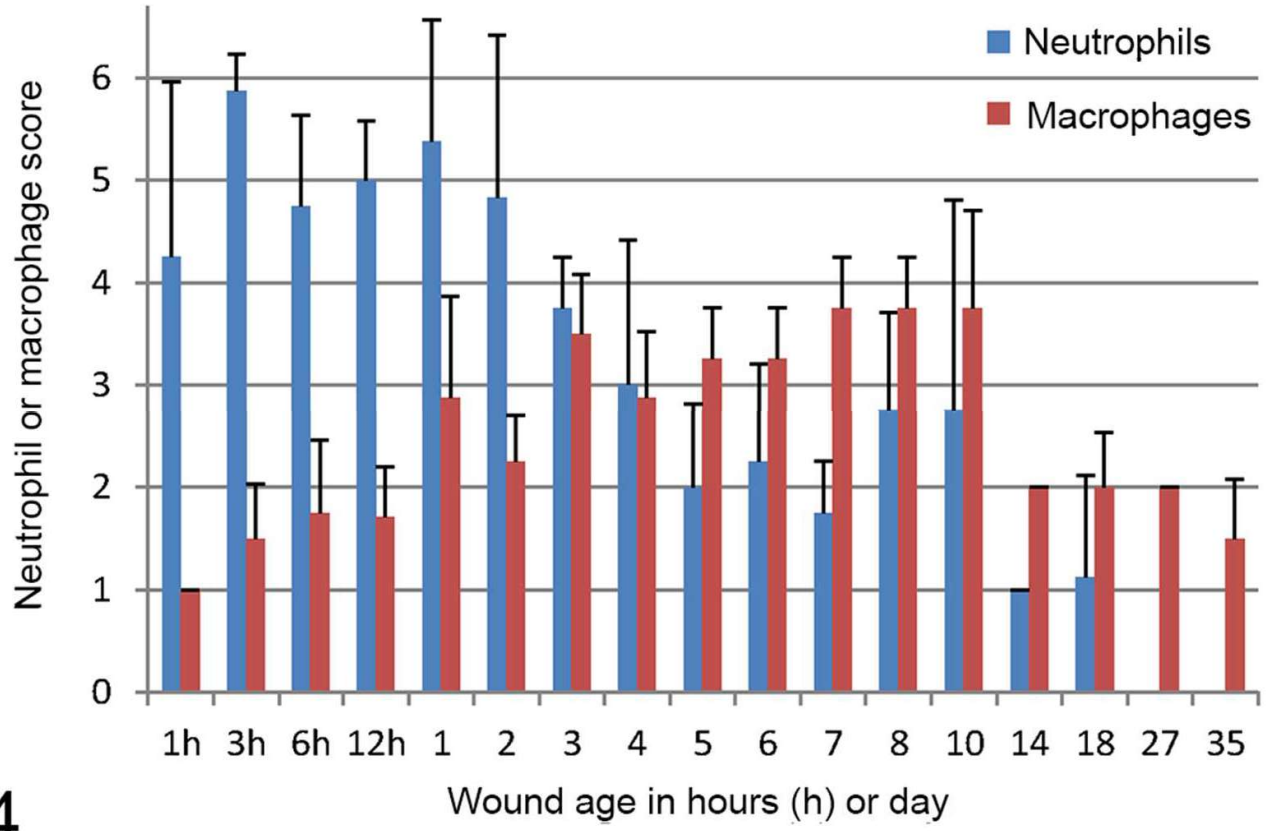
Experimental wound, 8 days
Hemosiderophages



Experimental wound, 18 days
Complete epithelialization



Neutrophils and macrophages in experimental porcine wounds



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Wound age	Histological manifestations relevant for age determination	N : M ratio
1h	Clot	4:1
3h		4:1
6h		3:1
12h	Migration of epithelial cells	3:1
1d		2:1
2d	Angiogenesis	2:1
3d	Plumb shaped fibroblasts	1:1
4d	Granulation tissue	1:1
5d		1:2
6d		1:1
7d		1:2
8d	Hemosiderophages	1:1
10d		1:1
14d		1:2
18d	Complete epithelialization	1:2
27d		-
35d		-

Barington, K., Dich-Jørgensen, K. and H.E. Jensen. A model for forensic pathomorphological age assessment of porcine wounds.


Thank you for your attention